

1           1.    A method comprising:  
2                    demultiplexing at least two wavelengths from a  
3 multiplexed optical signal;  
4                    detecting each of said demultiplexed wavelengths;  
5 and  
6                    generating a third wavelength to multiplex on  
7 said multiplexed optical signal.

1           2.    The method of claim 1 including providing an  
2 angled reflector in the path of said multiplexed signal to  
3 reflect light of a first wavelength to a first detector and  
4 to pass light of a second wavelength.

1           3.    The method of claim 1 including receiving said  
2 multiplexed optical signal over a waveguide and impressing  
3 said third wavelength on said waveguide.

1           4.    The method of claim 1 wherein demultiplexing  
2 includes providing an integrated reflector with a detector  
3 of a first wavelength of said at least two wavelengths.

1           5.    The method of claim 4 including providing an L-  
2 shaped detector.

1           6.    The method of claim 5 including forming said  
2 detector on an electrooptical bench.

1           7.    The method of claim 6 including providing a  
2   trench in said bench to receive a portion of said L-shaped  
3   detector.

1           8.    The method of claim 6 including forming said  
2   reflector on the surface of said detector.

1           9.    The method of claim 8 including forming said  
2   reflector by coating alternate layers of material on said  
3   detector.

1           10.   The method of claim 8 including using said trench  
2   to position said detector on said bench.

1           11.   The method of claim 7 including forming  
2   electrical connections from said bench to one portion of  
3   said L-shaped detector.

1           12.   An optical system comprising:  
2                a waveguide;  
3                a demultiplexer coupled to said waveguide to  
4   demultiplex at least two wavelengths from a multiplexed  
5   optical signal on said waveguide, said demultiplexer  
6   including photodetectors to detect each of said  
7   wavelengths; and

8           a multiplexer coupled to said waveguide to  
9   multiplex an optical signal of a third wavelength onto said  
10   waveguide.

1           13. The system of claim 12 wherein said demultiplexer  
2   includes an angled reflector to reflect light of a first  
3   wavelength to a first detector and to pass light of a  
4   second wavelength.

1           14. The system of claim 12 wherein said multiplexer  
2   includes a laser coupled to a curved waveguide, said curved  
3   waveguide having a portion arranged proximately to said  
4   waveguide.

1           15. The system of claim 14 wherein said laser is  
2   coupled at one end of said curved waveguide and a power  
3   monitor is coupled to the other end of said curved  
4   waveguide.

1           16. The system of claim 12 wherein said demultiplexer  
2   includes an integrated reflector and photodetector, said  
3   photodetector to detect a wavelength passed by said  
4   reflector.

1           17. The system of claim 16 wherein said integrated  
2   reflector and detector includes an L-shaped detector.

1        18. The system of claim 17 wherein said  
2 demultiplexer, said multiplexer, and said waveguide are  
3 formed on a planar substrate including a trench to receive  
4 one arm of said L-shaped detector.

1        19. The system of claim 18 wherein said reflector is  
2 formed on the surface of said photodetector.

1        20. The system of claim 19 wherein said reflector  
2 includes a plurality of layers of material coated on said  
3 detector.

1        21. A photodetector comprising:  
2                an L-shaped body; and  
3                an optical reflector on one surface of said body  
4 to reflect one wavelength and to transmit another  
5 wavelength.

1        22. The photodetector of claim 21 wherein said  
2 reflector includes at least two layers on said surface.

1        23. The photodetector of claim 21 wherein said  
2 photodetector includes two portions arranged at  
3 approximately 90 degrees to one another, each of said  
4 portions being formed of multilayer packages.

1        24. The photodetector of claim 21 wherein said L-  
2 shaped body may be formed of a multilayer package and a  
3 lead frame.

1        25. The photodetector of claim 21 wherein said  
2 reflector includes a layer of filter material that filters  
3 out one wavelength and a layer of reflector that reflects  
4 another wavelength.